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The 1985 Inshore Capelin Fishery in Div. 3K

by

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Abstract

Preliminary landings in Div. 3K in 1985 were 6682 t. From age compositions derived from samples collected from the inshore commercial capelin fishery, the 1985 catch was dominated by the 1982 year-class. The relatively strong 1980 year-class which dominated the catch in 1984 as four-year-olds constituted 11.5% of the 1985 catch as five-year-olds. Reported discarding was higher in 1985 for all gear types than in previous years. Purse seiners encountered redfeed problems while fixed gear fishermen most often discarded capelin because of low percentages of females and market-related problems such as boat and plant quotas. Catch/effort indices did not show a consistent trend among the three gear types.

Résumé

Les chiffres préliminaires sur les débarquements de capelan dans la division 3K en 1985 s'élèvent à 6 682 t. D'après la répartition par âge des échantillons prélevés des prises commerciales de capelan chez les pêcheurs côtiers, on constate que les prises de 1985 sont surtout composées de poissons de classe d'âge de 1982. La classe d'âge relativement forte de 1980 qui a dominé les prises de I984, comme sujets de quatre ans, a composé 11,5 % des prises de 1985, comme sujets de cinq ans. Les rejets de poisson ont été plus élevés en 1985 qu'au cours des années précédentes et ce, pour tous les types d'engins de pêche. Les senneurs ont eu des problèmes à cause de la présence de "redfeed" chez le capelan alors que les prises rejetées par les pêcheurs aux engins fixes l'ont été le plus souvent à cause du faible pourcentage de femelles et de problèmes relatifs aux marchés (contingents imposés aux bateaux et aux usines). Les indicateurs prises/effort n'ont révélé aucune tendance uniforme chez les trois types d'engins.

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Introduction

Landings in Div. 2J3K by the inshore capelin fishery were slightly lower in 1985 than in 1984 with the bulk of the landings coming from Div. 3K (Table 1). The history of the inshore fishery was documented in Carscadden et al. (1984). The 1985 fishery opened later than in previous years and continued well into July. This report briefly describes the 1985 inshore fishery, presents age-composition data derived from commercial samples collected during the fishery, and analyzes research logbook data submitted to us by commercial fishermen.

Materials and Methods

Commercial samples were collected by fishermen and at fish plants during the 1985 capelin fishery in Div. 3K. A total of 47 commercial capelin samples were processed and 1745 otolith pairs were aged (Table 2). Age compositions of the commercial catch were calculated using these samples. Age compositions for 1984 were changed from those given in Nakashima and Harnum (1985) due to more recent catch data being available. The percentages were modified slightly, however, the trends described for the 1984 fishery remain unchanged.

In 1985 research logbooks were distributed to 10 purse seine, 13 beach seine, and 15 capelin trap fishermen who resided in Div. 3K. From this sample, five purse seine, five beach seine and 11 capelin trap logbooks were returned. The others did not fish (six) or failed to return their logbooks (11). An additional five purse seine fishermen who live in Div. 3L fished part of the season in Div. 3K and their records were included in this analysis. The efficacy of capelin research logbook surveys was discussed in Nakashima (1984).

Results

The Fishery

The inshore fishery has been regulated by quota since 1982. The breakdown of quota allocations from 1982 to 1985 is given in Appendix 1. Monitoring of capelin for maturity level and redfeed content was conducted periodically by Fisheries Operations Branch of DFO prior to the opening of the fishery. The capelin fishery in Div. 2J3K opened on June 28, 1985 and closed on September 1, 1985. Most fishermen had ceased fishing by the end of July.

For all of Newfoundland (the majority of the landings are in Div. 3L) the tonnage of frozen females sold was down from 17,600 t in 1984 to 14,267 t in 1985. Prices paid to fishermen per pound declined from 9.89¢ in 1984 to 7.85¢ in 1985 (1985 data are still preliminary).

Sampling Program

The number of samples from the fishery has increased since 1984 due to a more efficient sampling program. Collection sites were spread throughout Div. 3K to obtain good geographical coverage of the fishery. Purse seine and capelin trap samples increased in 1985 (Table 2) from 1984 levels (Nakashima and Harnum 1985) and reflect the predominance of these gear types in the 1985 fishery. The use of beach seines has continued to decline while the number of fixed gear fishermen using capelin traps appears to have increased.

The mean number of otoliths collected per sample was the same in 1984 and 1985 for purse seines ($t = -0.16$, $df = 17$, $p > .05$) and for beach seines ($t = -0.23$, $df = 31$, $p > .05$) but significantly more otoliths were collected per sample in capelin traps in 1985 than in 1984 ($t = 5.36$, $df = 31$, $p < .001$). This suggests that a wider range of sizes of capelin were available to the trap fishery in 1985 than in 1984.

Age Composition of the Fishery

The catch in 1985 was dominated by the 1982 year-class as three-year-olds (Table 3). The 1980 year-class which dominated catches in 1983 as three-year-olds and in 1984 as four-year-olds represented 11.5% of the catch as five-year-olds in 1985 (Table 3). From these comparisons, we conclude that the 1980 year-class was relatively strong and contributed a substantial portion of the spawning biomass from 1983 to 1985.

Research Logbook Survey

Redfeed-related problems were the major cause of discarding capelin according to purse seine logbook records (Table 4). We have combined blackfeed and eggs in the stomach with redfeed problems under the general problem of 'redfeed'. Despite the presence of various food types in the stomach, redfeed was the predominant item. In 1985 a number of miscellaneous discarding problems were noted which included mixed herring-capelin catches, discarding excess capelin after the vessel was loaded, and dumping excess capelin which could not be trucked to fish plants. Redfeed problems were also important to purse seiner fishermen in 1982 and 1983 but were negligible in 1984. For fixed-gear fisheries, the incidence of redfeed was higher than in 1984 but not as high as the levels reported in 1983 (Table 5). Market-related problems and low percentages of females were cited as the major reasons for discarding capelin by beach seine and trap fishermen. Market problems entailed boat quotas, plant quotas, and times when plants were unable to handle more product due to daily capacity production.

The reported discards from all gear types have increased from previous years. Discards by purse seine fishermen represented 52% of the reported logbook landings in 1985 which was higher than the 32% estimated in 1984 (Table 6). For fixed gears in 1985, discarding was 77% by beach seiners (Table 7) and 99% by capelin traps (Table 8). In most instances, especially for traps and purse seines, capelin were reported to be released alive at sea. As in previous studies (Carscadden et al. 1984, Nakashima and

Harnum 1985), discarding refers to capelin which were caught and not landed regardless of their being released alive or let down dead. The latter occurrence is commonly referred to as 'dumping'.

Catch/effort data were available from 1981 to 1985 for purse seines and from 1983 to 1985 for beach seines and capelin traps. Catch/effort estimates for purse seines have fluctuated in a see-saw manner from 1981 to 1984 with the 1985 values being highest in the series for the catch/day (C/D), catch/set (C/S), and landings/set (L/S) series (Table 6). Unlike the purse seine estimates, catch/effort data for fixed gears were different. The beach seine catch/day (C/D) index indicated that 1985 was similar to 1984 while the catch/set (C/S) index implied an increase since 1983 (Table 7). The trap data on the other hand suggested a decline in landings/day (L/D), landings/haul (L/H), and catch/day (C/D) from 1984 to 1985 and stabilization for catch/haul (C/H) values from 1984 to 1985 (Table 8).

The beach seine data were the least reliable of the three gear types since sample sizes were small, landings were low, and fishing days and number of sets have declined from past years (Table 7). Moreover, from our logbook survey four out of 13 beach seine fishermen did not land capelin in 1985 because of poor markets for beach seine capelin and/or their late arrival inshore. The catch/day (C/D) is the most reliable of the four indices given since it combines reported landings and discards with actual fishing days. Disregarding the beach seine data, the C/D from purse seiners increased while the C/D from traps declined from 1984 to 1985.

By-catches of cod and herring in capelin traps remained at insignificant levels in 1985 (Table 8).

Discussion

The fishery in 1985 was hampered by the later arrival of capelin inshore, the reduced market needs of the Japanese buyers for Newfoundland female capelin, the high levels and prolonged occurrence of redfeed during the fishery (especially for purse seines), and the late opening of the fishery in all areas.

Sampling of the commercial catch in Div. 3K has improved significantly and was above the NAFO minimum sampling requirements of one sample of 200 fish for length-frequency analysis per 1000 t of catch per NAFO Division per gear type per quarter. The collection scheme in place will be continued in 1986.

The logbook survey data continue to provide valuable data on the discarding problem and on catch/effort indices for the three gear types involved in the fishery. The information for fixed gear fisheries is especially pertinent since there is no other source of reliable effort data. The increase in capelin trap data in 1985 has been due to efforts to expand our coverage in response to a shift by fixed gear fishermen towards utilizing traps instead of beach seines. The logbook survey will continue in 1986 with emphasis on expanding the fixed gear sample size.

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References

Carscadden, J., B. S. Nakashima and D. S. Miller. 1984. Observations on the capelin stock in Div. 2J3K. CAFSAC Res. Doc. 84/49. 42p.

Nakashima, B. S. 1984. Collection and interpretation of catch and effort data from the Division 3L inshore capelin fishery. CAFSAC Res. Doc. 84/24. 17 p.

Nakashima, B. S. and R. W. Harnum. 1985. The 1984 inshore capelin fishery in Div. 3K. CAFSAC Res. Doc. 85/16. 12 p.

Table 1. Inshore capelin landings (t), 1974-85.

Year	Div. 3K	Div. 2J	Total 2J3K
1974	1341	2	1343
1975	695	-	695
1976	1685	1	1686
1977	2136	-	2136
1978	2420	-	2420
1979	671	-	671
1980	1354	-	1354
1981	1803	-	1803
1982	3860	8	3368
1983	3764	4	3868
1984	7079	1	7080*
1985	6682	1	6683*

* preliminary

Table 2. Summary of the commercial samples collected and aged from the 1985 inshore capelin fishery in Div. 3K.

Gear type	No. of LSM/strat samples	No. otoliths aged (N)	No. otoliths ± SD per sample
Purse seine	15	520	34.7 ± 7.8
Beach seine	8	248	31.0 ± 7.4
Capelin trap	24	977	40.7 ± 4.2
TOTAL	47	1745	

LSM/strat - length, sex, maturity/strat

Table 3. Age-compositions (%) of capelin from the inshore commercial capelin fishery, Div. 3K, 1982-85.

	Age				
	2	3	4	5	6
Males					
1982	1.1	90.2	8.5	0.2	0.1
1983	0.2	65.0	34.8	0	0
1984	0	30.6	68.0	1.1	0
1985	0.7	62.1	34.3	3.0	0
Females					
1982	0.8	79.4	10.7	7.4	1.7
1983	0	44.0	52.6	3.4	0
1984	1.5	38.0	54.1	6.2	0.3
1985	1.8	55.1	26.8	15.7	0.5
Sexes combined					
1982	0.9	84.1	9.7	4.3	1.0
1983	0.1	62.4	37.1	0.4	0
1984	0.6	33.4	62.6	3.1	0.1
1985	1.4	57.4	29.3	11.5	0.4

Table 4. Reasons (expressed as % by weight) reported in logbooks for discarding capelin in purse seines in Div. 3K, 1981-85.

Year	Low % females	Redfeed	Not mature enough	Small females	Females spawned out	No market	Over ripe	Misc.	Unknown
1981	90	6	4	0	0	0	0	0	0
1982	32	52	0	10	6	0	0	0	0
1983	5	48	0	4	0	42	0	0	1
1984	81	4	0	2	8	3	2	0	0
1985	6	52	0	0	5	2	0	33	3

Table 5. Reasons (expressed as % by weight) reported in logbooks for discarding capelin from beach seines and traps in Div. 3K in 1983-85.

	Redfeed	Females over ripe	No market	Low % females	Males picked out	Females spawned out	Misc.	Unknown
Beach seine								
1983	47	3	37	6	7	0	0	0
1984	12	0	0	70	11	0	7	0
1985	13	0	64	23	0	0	0	0
Trap								
1983	81	0	0	4	1	15	0	0
1984	1	0	17	51	19	4	8	0
1985	19	0	27	28	19	+	2	4

Table 6. Capelin landings (t), discards (t), and catch/effort for purse seines in Div. 3K, 1981-85.

Year	No. fishermen	Landings		Discards logbook	No. days fished (D)	No. sets made (S)	L = Landings		C = Landings + discards	
		Statistics	Logbook				L/D	L/S	C/D	C/S
1981	10	533.9	725.0	92.9	89	118	8.2	6.1	9.2	6.9
1982	8	713.1	849.9	188.0	67	109	12.7	7.8	15.5	9.5
1983	14	808.2	1097.0	253.2	113	161	9.7	6.8	12.0	8.4
1984	10	854.1	928.0	297.1	87	127	10.7	7.3	14.1	9.7
1985	9	766.1	1067.2	551.5	98	129	10.9	8.3	16.5	12.6

Table 7. Capelin landings (t), discards (t), and catch/effort for beach seines in Div. 3K, 1983-85.

Year	No. fishermen	Landings		Discards logbook	No. days fished (D)	No. sets made (S)	L = Landings		C = Landings + discards	
		Statistics	Logbook				L/D	L/S	C/D	C/S
1983	6	118.6	139.4	39.5	44	79	3.2	1.8	4.1	2.3
1984	10	409.6	408.6	59.2	74	126	5.5	3.2	6.3	3.7
1985	4	59.5	61.6	47.7	17	19	3.6	3.2	6.4	5.8

Table 8. Capelin landings (t), discards (t), and catch/effort for capelin traps in Div. 3K, 1983-85.

Year	No. fishermen	No. traps	Landings		Discards logbook	Bycatch		No. days fished (D)	No. times hauled (H)	L = Landings		C = Landings + discards	
			Statistics	Logbook		Cod	Herring			L/D	L/H	C/D	C/H
1983	3	3	87.3	85.8	51.3	6.0	24.9	41	48	2.1	1.8	3.3	2.9
1984	6	6	156.0	217.0	111.3	2.6	0.1	80	101	2.7	2.1	4.1	3.3
1985	9	9	172.6	212.0	209.9	2.8	0	132	123	1.6	1.7	3.2	3.4

APPENDIX 1

Allocation of quotas (t) and opening dates for the inshore commercial fishery in Div. 2J3K.

Year	Area	Fixed gear	Purse seine	Reserve	Total	Product use	Opening date
1982	2J3K	1000	1000	1000	3000	Frozen females	June 1
1983	Notre Dame Bay	1500	1500		3000	Frozen females	June 15
	White Bay	1500	1500		3000	Frozen females	June 15
	2J3K	1000	1000		2000	Roe extraction	June 15
1984	Notre Dame Bay	2500	2500		5000	Frozen females	June 15
	White Bay & Labrador	1500	1500		3000	Frozen females	June 15
1985	Notre Dame Bay	2500	2500		5000	Frozen females	June 28
	White Bay & Labrador	1500	1500		3000	Frozen females	June 28